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Effects of an assisted repeated reading program on student fluency in a large class in Burkina Faso

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Abstract

Due to large class size and typically frontal teaching, learning to read is extremely difficult for elementary school students in Burkina Faso, who struggle to develop the fluency needed for comprehension. This study examined the effects of an assisted repeated reading program (ARR) on student fluency development in a large third grade class in Burkina Faso. The fluency of 94 students was assessed before and after the intervention. The results show that this program had a positive effect on the fluency development of poor and very poor readers.

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1. Introduction

Reading allows people and societies to thrive, no matter where they are in the world (OECD, 2013.). Literacy skills are fundamental to informed decision-making, personal empowerment and participation in the local and global social community (Stromquist, 2005). In Burkina Faso, as in many other developing nations, the ability to read is especially important as it is the key to poverty reduction. This country has made huge progress in terms of access to primary education, with the number of enrolments doubling in 10 years (MEBA and CONFEMEN, 2009). However, these massive enrolments have been accompanied by high repetition and dropout rates (Vachon, 2008) as well as low success rates in French and mathematics (MEBA and CONFEMEN, 2009). It is therefore vital to focus more on instruction quality, beginning with how reading is taught, as this can have a major impact on the duration of

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schooling and school attendance (UNESCO, 2005). Since it is an important predictor of reading skills (Zorman, Lequette, Pouget, Devaux and Savin, 2008), reading fluency is an element to consider to foster academic success. With this aim in mind, this study sought to investigate the effects of an assisted repeated reading program (ARR) adapted to local realities and the needs of young children who now have access to school.

2. Statement of the problem

Burkina Faso has made great strides on the education front in recent years (Vachon, 2008; Ministère de l'enseignement de base et de l'alphabétisation [Ministry of Basic Education and Literacy of Burkina Faso] CONFEMEN, 2009). Enrolments have grown sharply since 1997, increasing from 800,000 to 1.6 million at the primary level. However, despite the remarkable efforts to provide universal access to basic education and the results obtained, the situation remains worrisome since much like other countries in Sub-Saharan Africa, quantitative gains sometimes come at the expense of quality (Acedo, 2008). Educating such a large number of pupils is fraught with formidable challenges.

2.1 Large class size

Large classes are often perceived as a major obstacle to improving the quality of education (UNESCO, 2006). According to the *Burkina Faso Country Case Study Prepared for the Education for All Global Monitoring Report 2008*, the increase in the number of children attending school is creating learning difficulties. The pupil/teacher ratio exceeds 200:1 and is even greater in urban areas (Vachon, 2008). The scientific literature reports negative effects associated with teaching large classes, in particular, where instruction time and classroom management is concerned (Benbow, Mizrachi, Oliver and Said-Moshiro, 2007). Class size is also closely tied to teacher motivation (Michaelowa, 2003; Benbow et al., 2007). Finally, Vachon (2008) also found a correlation between overcrowded classes and learning difficulties.

That said, the effect of class size in developing nations cannot be clearly determined. Based on PASEC's data, the effect is small (Michaelowa, 2003). Michaelowa provides a possible explanation for this: "It seems as if in most countries considered, teachers tend to practice "frontal" teaching and do not change to more participatory pedagogical approaches even when class size is reduced." (p.11) The fact is that from kindergarten to university, the African teaching style is largely one of knowledge transmission (Grêt, 2009). According to Dembélé (2003), this type of instruction assigns students a passive role that is limited to memorizing and regurgitating factual information to the teacher. In such a context, student achievement is very much tied to the methods employed by the teacher. Gauthier and Dembélé (2004) argue that what teachers do in the class is undoubtedly the key educational determinant in student learning and achievement. It is therefore essential that African classrooms adopt more appropriate and effective instructional practices, particularly for reading.

2.2 Struggling novice readers

Several years ago, Burkina Faso's Ministry of Basic Education and Literacy (MEBA) implemented a system to assess educational attainment. For the 2005-2006 school year, a reading test was administered to 512 grade 2 students. Only 9% were able to read fluently. These results show that learning to read under the conditions described earlier is difficult and that fluency is not easily developed. A number of studies on the types of instructional practices that promote reading fluency (Kuhn and Stahl, 2003; Rasinski, 2003; Rasinski, Blachowicz and Lems, 2006) explain how and why it is important to implement them. Because few of these studies were conducted in Africa, it is important to experiment with evidence-based teaching practices that promote fluency, applying them to the Burkinabé educational context, which is, among other things, characterized by large class size.

3. Conceptual framework

3.1. Reading fluency

Until recently, fluency was not considered a priority in reading instruction (Rasinski et al., 2006). The scientific community began taking a greater interest in fluency when research showed that it was a necessary prerequisite to good comprehension (Laberge and Samuels, 1974; Stanovich, 1980). More recently, a meta-analysis conducted by the National Reading Panel (2000) concluded that fluency is a key component of effective reading instruction.

Researchers tend to agree on the three main components of fluency: (a) **accuracy** in word decoding, (b) **automaticity** in word recognition, and (c) appropriate use of **prosody**. The first, **accuracy**, refers to the ability to easily and adequately convert letters into sounds (Ellery, 2009). The second, **automaticity**, is defined as the ability to quickly recognize words automatically, with little cognitive effort or attention (Harris and Hodges, 1995). Lastly, **prosody** consists of various aspects that make oral reading expressive: intonation, stress and rhythm (Kuhn and Stahl, 2003). Although many authors agree that fluency consists of these three components, others suggest that fluency should encompass more than just oral reading (Pikulski and Chard, 2005; Samuels, 2002). Since fluency is not in and of itself a reading goal (Allington 1983), it is important to insist on the role it plays in comprehension (Kuhn and Stahl 2003; Pikulski and Chard, 2005).

Research shows that in order to develop fluency, children need to read more and with high accuracy (Allington, 2009). According to the National Reading Panel (2000), interventions to encourage students to engage in extensive, independent reading are not enough to significantly improve fluency. The assisted repeated reading approach is more effective in this regard. **Repeated oral reading** is one of the best-known methods for improving fluency (National Reading Panel, 2000; Kuhn and Stahl, 2003, Meyer and Felton, 1999, Therrien, 2004). With this approach, students read and reread an assigned passage individually until they reach an appropriate level of fluency (Samuels, 1979). Repeated oral reading programs often include support from tutors, peers, adults, audiotapes or other means (National Reading Panel, 2000) and offer a useful model for developing fluency (Allington, 2009). This strategy provides struggling readers with a precise reading model, with appropriate speed, intonation and expression (Kuhn, 2009).

3.2. Teaching large classes

As mentioned earlier, large classrooms are often perceived as a major hindrance to improving the quality of education (UNESCO, 2006). Such conditions are especially acute in the developing world, where class size can swell to over 100 students (Benbow et al., 2007). For most of these countries, the ongoing strong demand for education, combined with limited resources, means the situation is unlikely to improve in the near term (Valerien, 1991). Consequently, according to Valerien (1991), effective methods must be found for large classroom instruction since, at the present time, the repertoire of effective teaching practices for overcrowded classes remains limited (Benbow et al., 2007).

Although little data exist on the effectiveness of teaching methods used to cope with large classrooms, Benbow and her colleagues (2007) managed to compile a list of potentially effective methods that include team teaching, the use of small groups, and peer tutoring. The use of **groupings** is a recurring suggestion in the literature on teaching in large classrooms (O'Sullivan, 2006; Pasigna, 1997). Group work also encourages student interaction. From the standpoint of cognitive development, inter-student interaction during an appropriate task can lead to increased conceptual understanding (Slavin, 1996). Group work is therefore a possible solution to improve learning outcomes in large classroom settings while simultaneously fostering cognitive development. There are several instructional strategies based on group work, including cooperative learning, peer tutoring and within-class groupings, and while they are praised by many authors (Cohen, 1994; Kulik and Kulik, 1987; Slavin, 1996; Topping and Ehly, 1998), the fact is that most of them have only been tested in the Western world.

The use of groupings therefore seems to be an effective way to improve instruction quality in large classrooms.

Perhaps this method can also be used with assisted repeated reading to teach reading fluency.

This study therefore had two objectives:

- 1) Assess the effects of an assisted repeated reading program on third grade students in Burkina Faso; and
- 2) Analyze the implementation of this program in a large classroom setting.

4. Methodology

4.1. Population

The school is located in the popular neighbourhood of Bobo-Dioulasso. The residents of this predominantly Muslim neighbourhood are mostly merchants or farmers. The elementary school has 903 students attending grades 1 through 5, with an average of 141 students per class. This study was conducted using the grade 3 class, which had 141 students and 2 teachers (due to its large size). At the time of the study, a student teacher was also present.

4.2 Procedures

A mixed-method approach was used for this study. A quasi experiment was conducted for the first objective, i.e. to assess the effects of ARRP on third grade students in Burkina Faso. Out of the 141 students in the class, 94 participated in the study. The remainder could not because they had not mastered grapheme-phoneme correspondence. During the ARRP sessions, these students received appropriate instruction from the classroom teacher. The participating students were divided into two groups: intervention condition (N=46) and control condition (N=48). To make the groups equivalent, the students were grouped by fluency.

4.3 The ARR program

The ARR program was developed by the researcher with input from the two teachers. Table 1 presents its main characteristics.

Table 1: Characteristics of the ARR program	
Formation of reading subgroups	The experimental group is divided into subgroups of 6 or 7 students. The subgroups are heterogeneous, i.e. made up of strong, average and poor readers. A strong reader assumes the role of tutor in each subgroup and is assisted by another strong reader.
Duration and frequency	The intervention takes place over 8 weeks, with 15-minute sessions held 3 times a week.
Organization of the space	Sessions are held in the schoolyard to ensure adequate space between subgroups.
Learning material	The learning material consists of eight texts written on large posters. The texts are 50-65 words each and are based on local realities. Each subgroup is assigned a different text to read every week. The assigned text is reread at each session during the week.
Description of activities	<ol style="list-style-type: none"> 1) Predictions: The children predict the content of the text based on its title and on pictures. 2) Modeling: The tutor reads the text out loud to demonstrate how it should sound. 3) Assisted repeated reading: Each student then reads the entire text with help from the tutor. 4) Comprehension questions: The tutor asks questions about key elements of the text.
Teacher's role	A teacher supervises the activity, offering advice, feedback, encouragement and demonstrations.
Tutor's role	The tutor must follow a certain procedure when a reader struggles or makes a miscue, namely, give him 4 seconds to self-correct. If he is unable to do so, the tutor helps the reader break down the word into syllables using a cover card and a pointer.

4.4 Instruments

The number of words read correctly per minute (WCPM) was calculated for the 94 students at the beginning and at the end of the 8-week intervention. This metric assesses two fluency components: *accuracy*, or number of words

read correctly, and *automaticity*, or speed with which the learner reads a given text (Kuhn, 2009). A 181-word elementary school level text was selected for the WCPM calculation. Kuhn (2009) recommends using a 100-200-word text to assess fluency, particularly if a large number of students are evaluated at the same time. The same text was used for both calculations. This text was not used in the intervention sessions.

5. Results

5.1 Deviation between mean pre-test and post-test scores

Table 2 presents the post-test results by skill level. These results show that for all skill levels, the deviation between the mean pre-test and post-test scores is greater for the intervention groups and especially significant for the very poor, poor and average readers.

Table 2: Mean pre-test and post-test scores

Variable	Skills	Pre-test Scores (mean and standard deviation)		Post-test Scores (mean and standard deviation)		Deviation Between Pre-test and Post-test Means	
		Control Condition (N=47)	Intervention Condition (N=43)	Control Condition (N=47)	Intervention Condition (N=43)	Control Condition (N=47)	Intervention Condition (N=43)
WCPM	Very strong	50.30 (10.77)	53.60 (8.93)	57.05 (11.97)	62.58 (9.16)	6.75	8.98
	Strong	30.00 (3.57)	29.07 (2.23)	39.36 (9.09)	42.55 (6.5)	9.36	13.47
	Average	21.46 (2.68)	20.13 (2.57)	28.00 (7.11)	34.19 (5.95)	6.54	14.06
	Poor	7.70 (2.04)	11.62 (1.59)	13.15 (4.68)	21.92 (2.67)	5.45	10.30
	Very poor	1.33 (2.06)	1.88 (2.34)	1.94 (2.58)	6.67 (4.19)	0.61	4.79

5.2 Effect of the intervention on fluency

A paired-samples t-test was conducted to assess the effect of the intervention on fluency. Since this test allows us to compare the subjects with themselves before and after the intervention, we can determine whether the differences between the means of the intervention group are significant.

The results of the t-test show a significant difference between the pre- and post-test means (at $p < 0.01$), indicating that the WCPM of the students in the intervention group was significantly higher after the intervention. To evaluate the magnitude of this finding, the effect size was also calculated. At 0.8, the effect size is large.

The next step was to compare, using an independent samples t-test, the post-test means of the intervention and control groups in order to evaluate whether the difference was due to chance or to the intervention. The results showed a significant difference for the very poor readers and the poor readers, (at $p < 0.01$). There was no significant difference between the intervention and the control group for the average, strong and very strong readers. Since the analyses were conducted over a small number of participants, these encouraging results must be carefully interpreted. However, this is a first step toward a better comprehension of innovative instructional practices that could take place in a large class size to better respond to the needs of the most vulnerable children.

6. Discussion

After analyzing the results, it appears that in general, the ARR program had a positive effect on the fluency of third grade students. The WCPM scores of the students in the intervention group, all levels combined, improved after the eight-week program. This can be explained by the fact that this program greatly increased the students' exposure to appropriate texts with one-on-one support. As mentioned earlier, although fluency development is influenced by how much students read, they must also be provided with texts that they can read accurately (Allington, 2009). In this program, the significant scaffolding helped students achieve high accuracy. The use of echo reading, repeated reading and peer tutoring meant students received optimal support, thereby increasing their chances of reading fluently. The combination of these three technical aids therefore allowed the students to develop their fluency. However, a comparison of the results obtained in the post-test by the students in the intervention group and in the control group shows that the poor and very poor students derived the most benefit from these aids. It is therefore reasonable to assume that the struggling readers benefited the most from the significant scaffolding.

7. Conclusion

This assisted repeated reading program is promising, first because it has a positive impact on readers' fluency development and second, because it meets the varied needs of students in large classrooms. It also eases the workload of Burkinabé teachers. Using peer tutoring greatly increases student exposure to the written word, something that is very difficult for one teacher to do alone. Using strength in numbers to delegate tasks to stronger learners in large classrooms is an effective and culturally appropriate approach to improving the quality of reading instruction in Burkina Faso. Ethnologist Pierre Erni (1987) found that in traditional African cultures, the peer-to-peer education that takes place in child culture is the main form of socialization. African students would probably derive greater benefits if horizontal teaching was used from time to time. An interesting future study would be to observe how this approach also benefits the development of reading and other skills in stronger students and peer tutors.

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